



# UNITED STATES PATENT AND TRADEMARK OFFICE

*ccw*

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/764,629	01/26/2004	Brian William Kroeger	IBIQ 63323	1694
29694	7590	04/23/2007	EXAMINER	
PIETRAGALLO, BOSICK & GORDON LLP			GUARINO, RAHEL	
ONE OXFORD CENTRE, 38TH FLOOR				
301 GRANT STREET			ART UNIT	PAPER NUMBER
PITTSBURGH, PA 15219-6404			2611	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/23/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/764,629	KROEGER, BRIAN WILLIAM
	Examiner	Art Unit
	Rahel Guarino	2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 1-26-2004.  
 2a) This action is FINAL. 2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-42 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-4,9-11,21-23,30-32 and 34 is/are rejected.  
 7) Claim(s) 4,12,24,25,33 and 35-42 is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO/SB/08)  
 Paper No(s)/Mail Date 1/26/2004.

4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 101***

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

**Claim 1-4 and 14-20 are rejected under 35 U.S.C. 101** because the claimed invention is directed to non-statutory subject matter.

Claim 1-4 and claim 14-20 pertain solely to a digital audio broadcasting signal and characteristics of the signal without recitation of any step(s) to be performed on a computer or any process activity that ties to physical acts or data manipulation representing physical objects or activities to achieve a practical application.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claim 1-3, 9-11, 13, 21-23, 30-32 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kroeger et al. US, 6,487,256 in view of Sarraf et al. US, 6,445,693.**

Re claim 1, Kroeger discloses an AM compatible digital audio broadcasting signal (AM in-band on-channel (IBOC) digital audio broadcasting (DAB), col. 1 line 11-14), the signal comprising:

an analog modulated carrier signal (24; fig. 1) centrally positioned in a radio channel (18, fig. 1; col. 3 line 9-10), wherein the analog modulated carrier signal is modulated by an analog signal (col. 3 line 5-10), does not teach digital modulation of signals subcarrier are modulated using complementary pattern-mapped trellis code modulation (CPTCM) including a code mapped to overlapping partitions; and

However, Sarraf teaches convolution coding technique based on CPPC, wherein the digitally modulated subcarrier signals (OFDM subcarriers (col. 3 line 60-66)), including a code mapped to overlapping partitions.

Therefore, taking the combined teaching of Kroeger and Sarraf as a whole would have been rendered obvious to one skilled in the art to modify Kroeger to utilize complementary pattern-mapped trellis code modulation (CPTCM) coding technique based on CPPC for the benefit of estimating the power (col. 5 line 7-17, "Sarraf").

Re claim 2, the modified invention as claimed of claim 1, wherein the code comprises:

a complementary punctured convolutional code (col. 4 line 42-46, "Sarraf").

Re claim 3, the modified invention as claimed in claim 1, wherein:

the analog modulated carrier signal and the plurality of digitally modulated subcarrier signals are in a 20 kHz channel (col. 3 line 5-10, "Kroeger") and the analog modulated signal is delayed with respect to the plurality of digitally modulated subcarrier

signals (col. 6 line 52-61, "Kroeger").

Re claim 9, Kroeger discloses a receiver for receiving an AM compatible digital audio broadcasting signal (76, fig. 6), the receiver comprising:

an antenna (78, fig.6) for receiving a composite signal(transmitted signal) with comprising an analog modulated carrier signal (24; fig.1) centrally positioned in a radio channel (18, fig.1; col. 3 line 9-10), wherein the analog modulated carrier signal is modulated by an analog signal (col. 3 line 5-10), and a plurality of digitally modulated subcarrier signals in the radio channel (col. 7 line 17-21), does not teach wherein the digitally modulated subcarrier signals are modulated using complementary pattern-mapped trellis code modulation including a code mapped to overlapping partitions.

means for producing an output in response to the composite signal (col. 7 line 23-26).

However, Sarraf teaches convolution coding technique based on CPPC, wherein the digitally modulated subcarrier signals (OFDM subcarriers (col. 3 line 60-66)), including a code mapped to overlapping partitions.

Therefore, taking the combined teaching of Kroeger and Sarraf as a whole would have been rendered obvious to one skilled in the art to modify Kroeger to utilize complementary pattern-mapped trellis code modulation (CPTCM) coding technique based on CPPC for the benefit of estimating the power (col. 5 line 7-17, "Sarraf").

Re claim 10, the modified invention as claimed in claim 9, wherein the code comprises:

a complementary punctured convolutional code (col. 4 line 42-46, "Sarraf").

Re claim 11 the modified invention as claimed in claim 9, wherein: the analog modulated carrier signal and the plurality of digitally modulated subcarrier signals are in a 20 kHz channel (col. 3 line 5-10, "Kroeger") and the analog modulated signal is delayed with respect to the plurality of digitally modulated subcarrier signals (col. 6 line 52-61, "Kroeger").

Re claim 13, the modified invention as claimed in claim 9, wherein: the composite signal and the data service signal are processed on interleaver block boundaries (col. 4 line 56-59, "Sarraf").

Re claim 21, a method of broadcasting an AM compatible digital audio broadcasting signal, the method comprising the steps of:

producing an analog modulated carrier signal (24; fig. 1) centrally positioned in a radio channel (18, fig. 1; col. 3 line 9-10), wherein the analog modulated carrier signal is modulated by an analog signal (col. 3 line 5-10); producing a plurality of digitally modulated subcarrier signals in the radio channel (col. 7 line 17-21), does not teach digital modulation of signals subcarrier are modulated using complementary pattern-mapped trellis code modulation (CPTCM) including a code mapped to overlapping partitions.

However, Sarraf teaches convolution coding technique based on CPPC, wherein the digitally modulated subcarrier signals (OFDM subcarriers (col. 3 line 60-66)), including a code mapped to overlapping partitions.

Therefore, taking the combined teaching of Kroeger and Sarraf as a whole

would have been rendered obvious to one skilled in the art to modify Kroeger to utilize complementary pattern-mapped trellis code modulation (CPTCM) coding technique based on CPPC for the benefit of estimating the power (col. 5 line 7-17, "Sarraf").

transmitting the analog modulated carrier signal and the plurality of digitally modulated subcarrier signals (col. 7 line 22-24).

Re claim 22, the modified invention as claimed in claim 21, wherein the code comprises: a complementary punctured convolutional code (col. 4 line 42-46, "Sarraf").

Re claim 23, the modified invention as claimed in claim 21, wherein: the analog modulated carrier signal and the plurality of digitally modulated subcarrier signals are in a 20 kHz channel (col. 3 line 5-10, "Kroeger") and the analog modulated signal is delayed with respect to the plurality of digitally modulated subcarrier signals (col. 6 line 52-61, "Kroeger").

Re claim 30, a receiver for receiving an AM compatible digital audio broadcasting signal, the receiver signal (76, fig. 6) comprising:

an antenna (78, fig.6) for receiving a composite signal(transmitted signal) with comprising an analog modulated carrier signal (24; fig.1) centrally positioned in a radio channel (18, fig.1; col. 3 line 9-10), wherein the analog modulated carrier signal is modulated by an analog signal (col. 3 line 5-10), and a plurality of digitally modulated subcarrier signals in the radio channel (col. 7 line 17-21), does not teach wherein the digitally modulated subcarrier signals are modulated using complementary pattern-mapped trellis code modulation including a code mapped to overlapping partitions.

However, Sarraf teaches convolution coding technique based on CPPC, wherein

the digitally modulated subcarrier signals (OFDM subcarriers (col. 3 line 60-66)),

including a code mapped to overlapping partitions.

and an output device for producing an output in response to the composite signal.

Therefore, taking the combined teaching of Kroeger and Sarraf as a whole would have been rendered obvious to one skilled in the art to modify Kroeger to utilize complementary pattern-mapped trellis code modulation (CPTCM) coding technique based on CPPC for the benefit of estimating the power (col. 5 line 7-17, "Sarraf").

Re claim 31, the modified invention as claimed in claim 30, wherein the code comprises: a complementary punctured convolutional code (col. 4 line 42-46, "Sarraf").

Re claim 32, the modified invention as claimed in claim 30, wherein: the analog modulated carrier signal and the plurality of digitally modulated subcarrier signals are in a 20 kHz channel (col. 3 line 5-10, "Kroeger") and the analog modulated signal is delayed with respect to the plurality of digitally modulated subcarrier signals (col. 6 line 52-61, "Kroeger").

Re claim 34, the modified invention as claimed in claim 30, wherein: the composite signal and the data service signal are processed on interleaver block boundaries (col. 4 line 56-59, "Sarraf").

#### ***Allowable Subject Matter***

4. **Claim 4, 12, 24, 25, 33, 35-42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rahel Guarino whose telephone number is 571-270-1198. The examiner can normally be reached on M-F (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Payne David can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RG

*David Payne*  
DAVID C. PAYNE  
SUPERVISORY PATENT EXAMINER